



Descriptors for

Litchi

Litchi chinensis



Descriptors for

Litchi

Litchi chinensis

The International Plant Genetic Resources Institute (IPGRI) is an autonomous international scientific organization, supported by the Consultative Group on International Agricultural Research (CGIAR). IPGRI's mandate is to advance the conservation and use of genetic diversity for the well-being of present and future generations. IPGRI has its headquarters in Maccarese, near Rome, Italy, with offices in more than 20 other countries worldwide. The Institute operates through three programmes: (1) the Plant Genetic Resources Programme, (2) the CGIAR Genetic Resources Support Programme and (3) the International Network for the Improvement of Banana and Plantain (INIBAP).

The international status of IPGRI is conferred under an Establishment Agreement which, by January 2002, had been signed and ratified by the Governments of Algeria, Australia, Belgium, Benin, Bolivia, Brazil, Burkina Faso, Cameroon, Chile, China, Congo, Costa Rica, Côte d'Ivoire, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, Greece, Guinea, Hungary, India, Indonesia, Iran, Israel, Italy, Jordan, Kenya, Malaysia, Mauritania, Morocco, Norway, Pakistan, Panama, Peru, Poland, Portugal, Romania, Russia, Senegal, Slovakia, Sudan, Switzerland, Syria, Tunisia, Turkey, Uganda and Ukraine.

In 2001, financial support for the Research Agenda of IPGRI was provided by the Governments of Albania, Armenia, Australia, Austria, Belgium, Brazil, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, India, Ireland, Israel, Italy, Japan, Republic of Korea, Lithuania, Luxembourg, Macedonia (F.Y.R.), Malta, the Netherlands, Norway, Peru, the Philippines, Poland, Portugal, Romania, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, Turkey, Uganda, UK, USA and F.R. Yugoslavia (Serbia and Montenegro), and by the African Development Bank (AfDB), Asian Development Bank (ADB), Center for International Forestry Research (CIFOR), Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), Centro Agronómico Tropical de Investigación y Enseñanza, Costa Rica (CATIE), Centro Internacional de Agricultura Tropical (CIAT), Centro Internacional de la Papa (CIP), Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), Common Fund for Commodities (CFC), European Commission, European Environmental Agency, European Union, Food and Agriculture Organization of the United Nations (FAO), German Foundation for International Development (DSE), Global Forum on Agricultural Research (GFAR), Instituto Colombiano para el Desarrollo de la Ciencia y la Tecnología (COLCIENCIAS), Inter-American Drug Abuse Control Commission (CICAD), International Center for Agricultural Research in the Dry Areas (ICARDA), International Center for Living Aquatic Resources Management (ICLARM), International Centre for Research in Agroforestry (ICRAF), International Crops Research Institute for the Semi-Arid (ICRISAT), International Development Research Centre (IDRC), International Food Policy Research Institute (IFPRI), International Foundation for Science (IFS), International Fund for Agricultural Development (IFAD), International Institute of Tropical Agriculture (IITA), International Livestock Research Institute (ILRI), International Rice Research Institute (IRRI), International Service for National Agricultural Research (ISNAR), International Water Management Institute (IWMI), Japan International Research Centre for Agricultural

Science (JIRCAS), National Geographic Society, National Science Foundation (NSF), Programme on Participatory Research and Gender Analysis for Technology Development and Institutional Innovation (PGRA), Regional Fund for Agricultural Technology (FONTAGRO), Rockefeller Foundation, Taiwan Banana Research Institute (TBRI), Technical Centre for Agricultural and Rural Cooperation (CTA), Technova, United Nations Development Programme (UNDP), UNDP Global Environmental Facility (UNDP-GEF), United Nations Environment Programme (UNEP), UNEP Global Environmental Facility (UNEP-GEF), United States Department of Agriculture (USDA), United States Agency of International Development (USAID), Vlaamse Vereniging voor Ontwikkelingssamenwerking en Technische Bijstand (VVOB), West Africa Rice Development Association (WARDA) and the World Bank.

The geographical designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of IPGRI or the CGIAR concerning the legal status of any country, territory, city or area or its authorities, or concerning the delimitation of its frontiers or boundaries. Similarly, the views expressed are those of the authors and do not necessarily reflect the views of these organizations.

Mention of a proprietary name does not constitute endorsement of the product and is given only for information.

Citation:

IPGRI. 2002. Descriptors for Litchi (*Litchi chinensis*). International Plant Genetic Resources Institute, Rome, Italy.

ISBN 92-9043-557-7

IPGRI

Office for South Asia,

Ch. Devi Lal National Agriculture Science Centre

DPS Marg, Pusa Campus, New Delhi – 110 012, India

© International Plant Genetic Resources Institute, 2002

CONTENTS

PREFACE	vii
DEFINITIONS AND USE OF THE DESCRIPTORS	1
PASSPORT	4
1. Accession descriptors	4
2. Collecting descriptors	6
MANAGEMENT	13
3. Management descriptors	13
4. Multiplication/regeneration descriptors	16
ENVIRONMENT AND SITE	18
5. Characterization and/or evaluation site descriptors	18
6. Collecting and/or characterization/evaluation site environment descriptors	19
CHARACTERIZATION	30
7. Plant descriptors	30
EVALUATION	46
8. Plant descriptors	46
9. Abiotic stress susceptibility	47
10. Biotic stress susceptibility	48
11. Biochemical markers [specify methods used and cite reference(s)]	49
12. Molecular markers	49
13. Cytological characters	50
14. Identified genes	50
BIBLIOGRAPHY	51
CONTRIBUTORS	52
ACKNOWLEDGEMENTS	55
ANNEX I. Collecting form for litchi	57

PREFACE

Descriptors for Litchi (*Litchi chinensis*) were developed by Drs Mathura Rai, Nguyen Thi Ngoc Hue and Bhag Mal. Dr Bhag Mal coordinated the development of this descriptor list. A draft version prepared in the internationally accepted IPGRI format for descriptor lists was subsequently sent to a number of international experts for their comments and amendments. A full list of the names and addresses of those involved is given in 'Contributors'.

IPGRI encourages the collection of data for all five types of descriptors (see Definitions and Use of Descriptors), whereby data from the first four categories – *Passport, Management, Environment and site* and *Characterization* – should be available for any accession. The number of descriptors selected in each of the categories will depend on the crop and the importance of the crop's description. Descriptors listed under *Evaluation*, allow for a more extensive description of accession, but generally require replicated trials over a period of time.

Although the suggested coding should not be regarded as the definitive scheme, this format represents an important tool for a standardized characterization system and it is promoted by IPGRI throughout the world.

This descriptor list provides an international format and thereby produces a universally understood 'language' for plant genetic resources data. The adoption of this scheme for data encoding, or at least the production of a transformation method to convert other schemes to the IPGRI format, will produce a rapid, reliable and efficient means for information storage, retrieval and communication, and will assist with the utilization of germplasm. It is recommended, therefore, that information should be produced by closely following the descriptor list with regard to ordering and numbering descriptors, using the descriptors specified, and using the descriptor states recommended.

This descriptor list is intended to be comprehensive for the descriptors that it contains. This approach assists with the standardization of descriptor definitions. IPGRI does not, however, assume that each curator will characterize accessions of their collection utilizing all descriptors given. Descriptors should be used when they are useful to the curator for the management and maintenance of the collection and/or to the users of the plant genetic resources. However, highly discriminating descriptors are marked as highlighted text to facilitate selection of descriptors.

Multi-crop passport descriptors were developed jointly by IPGRI and FAO, to provide consistent coding schemes for common passport descriptors across crops. They are marked in the text as [MCPD]. Please note that owing to the generic nature of the multi-crop passport descriptors, not all descriptor states for a particular descriptor will be relevant to a specific crop. In Annex I, the reader will find a Collecting form for Litchi that will facilitate data collecting.

Any suggestions for improvement on the Descriptors for Litchi will be highly appreciated by IPGRI.

List of Descriptors

Allium (E,S,F)	2001	Forage legumes * (E)	1984	Plum * (E)	1985
Almond (revised) * (E)	1985	Grapevine (E,S,F)	1997	Potato variety * (E)	1985
Apple (E)	1982	Groundnut (E,S,F)	1992	Quinoa * (E)	1981
Apricot * (E)	1984	Jackfruit (E)	2000	Rice * (E)	1980
Avocado (E,S)	1995	Kodo millet * (E)	1983	Rocket (E,I)	1999
Bambara groundnut (E,F)	2000	<i>Lathyrus</i> spp. (E)	2000	Rye and Triticale * (E)	1985
Banana (E,S,F)	1996	Lentil * (E)	1985	Safflower * (E)	1983
Barley (E)	1994	Lima bean * (E,P)	1982	Sesame * (E)	1981
Beta (E)	1991	Lupin * (E,S)	1981	<i>Setaria italica</i> and	
Black pepper (E,S)	1995	Maize (E,S,F, P)	1991	<i>S. pumilia</i> (E)	1985
<i>Brassica</i> and <i>Raphanus</i> (E)	1990	Mango (E)	1989	Sorghum (E,F)	1993
<i>Brassica campestris</i> L. (E)	1987	Medicago (Annual) * (E,F)	1991	Soyabean * (E,C)	1984
Buckwheat (E)	1994	Mung bean * (E)	1980	Strawberry (E)	1986
<i>Capsicum</i> (E,S)	1995	Oat * (E)	1985	Sunflower * (E)	1985
Cardamom (E)	1994	Oca * (S)	2001	Sweet potato (E,S,F)	1991
Carrot (E,S,F)	1999	Oil palm (E)	1989	Taro (E,F,S)	1999
Cashew (E)	1986	<i>Panicum miliaceum</i> and		Tea (E,S,F)	1997
Cherry * (E)	1985	<i>P. sumatrense</i> (E)	1985	Tomato (E, S, F)	1996
Chickpea (E)	1993	Papaya (E)	1988	Tropical fruit * (E)	1980
<i>Citrus</i> (E,F,S)	1999	Peach * (E)	1985	<i>Vigna aconitifolia</i> and	
Coconut (E)	1992	Pear * (E)	1983	<i>V. trilobata</i> (E)	1985
Coffee (E,S,F)	1996	Pearl millet (E,F)	1993	<i>Vigna mungo</i> and	
Cotton (Revised) (E)	1985	<i>Phaseolus acutifolius</i> (E)	1985	<i>V. radiata</i> (Revised) * (E)	1985
Cowpea (E)	1983	<i>Phaseolus coccineus</i> * (E)	1983	Walnut (E)	1994
Cultivated potato * (E)	1977	<i>Phaseolus vulgaris</i> * (E,P)	1982	Wheat (Revised) * (E)	1985
Echinochloa millet * (E)	1983	Pigeonpea (E)	1993	Wheat and <i>Aegilops</i> * (E)	1978
Eggplant (E,F)	1990	Pineapple (E)	1991	White Clover (E)	1992
Faba bean * (E)	1985	<i>Pistacia</i> (excluding <i>Pistacia</i>		Winged Bean * (E)	1979
Finger millet (E)	1985	<i>vera</i>) (E)	1998	Xanthosoma (E)	1989
Forage grass * (E)	1985	Pistachio (A,R,E,F)	1997	Yam (E,S,F)	1997

IPGRI publications are available free of charge to the libraries of genebanks, university departments, research institutions, etc, particularly in the developing world. Organizations in the developed world and individual requesters will be asked to pay for some IPGRI publications, although specific titles may also be sent to individuals who can show that they have a particular need for a personal copy of a publication. Such requests should be made to the Head of Communications Services. A, E, F, I, R, S, C and P indicate Arabic, English, French, Italian, Russian, Spanish, Chinese, and Portuguese respectively. Titles marked with * are available only as photocopies. Various descriptor lists are available for downloading in portable document format from IPGRI's web site (URL: <<http://www.ipgri.cgiar.org/>>).

IPGRI publications can be ordered on-line via Earthprint @<http://www.earthprint.com/>

DEFINITIONS AND USE OF THE DESCRIPTORS

IPGRI uses the following definitions in genetic resources documentation:

Passport descriptors: These provide the basic information used for the general management of the accession (including the registration at the gene bank and other identification information) and describe parameters that should be observed when the accession is originally collected.

Management descriptors: These provide the basis for the management of accessions in the gene bank and assist with their multiplication and regeneration.

Environment and site descriptors: These describe the environmental and site-specific parameters that are important when characterization and evaluation trials are held. They can be important for the interpretation of the results of those trials. Site descriptors for germplasm collecting are also included here.

Characterization descriptors: These enable an easy and quick discrimination between phenotypes. They are generally highly heritable, can be easily seen by the eye and are equally expressed in all environments. In addition, these may include a limited number of additional traits thought desirable by a consensus of users of the particular crop.

Evaluation descriptors: The expression of many of the descriptors in this category will depend on the environment and, consequently, special environmental designs and techniques are needed to assess them. Their assessment may also require complex biochemical or molecular characterization methods. This type of descriptors includes characters such as yield, agronomic performance, stress susceptibilities and biochemical and cytological traits. They are generally the most interesting traits in crop improvement.

Characterization will normally be the responsibility of gene bank curators, while evaluation will typically be carried out elsewhere (possible by a multidisciplinary team of scientists). The evaluation data should be fed back to the gene bank which will maintain a data file.

Highly discriminating descriptors are marked as **highlighted text**:

The following internationally accepted norms for the scoring, coding and recording of descriptors states should be followed:

- (a) the Système International d'Unités (SI) is used;
- (b) the units to be applied are given in square brackets following the descriptor name;

- (c) standard colour charts, e.g. Royal Horticultural Society Colour Chart, Methuen Handbook of colour, or Munsell Colour Chart for Plant Tissues, are strongly recommended for all ungraded colour characters (the precise chart used should be specified in the section where it is used);
- (d) the three-letter abbreviations from the *International Standard (ISO) Codes for the representation of names of countries* are used;
- (e) many quantitative characters, which are continuously variable, are recorded on a 1-9 scale, where:

1 Very low	6 Intermediate to high
2 Very low to low	7 High
3 Low	8 High to very high
4 Low to intermediate	9 Very high
5 Intermediate	

is the expression of a character. The authors of this list have sometimes described only a selection of the states e.g. 3, 5 and 7, for such descriptors. Where this has occurred, the full range of codes is available for use by extension of the codes given or by interpolation between them, e.g. in Section 10 (Biotic stress susceptibility), 1 = very low susceptibility and 9 = very high susceptibility;

- (f) when a descriptor is scored using a 1-9 scale, such as in (e), "0" would be scored when (i) the character is not expressed, and (ii) a descriptor is inapplicable. In the following example, "0" will be recorded if an accession does not have a central leaf lobe:

Shape of central leaf lobe

- 1 Toothed
- 2 Elliptic
- 3 Linear

- (g) absence/presence of characters is scored as in the following example:

Terminal leaflet

- 0 Absent
- 1 Present

- (h) blanks are used for information not yet available;
- (i) for accessions which are not generally uniform for a descriptor (e.g. mixed collection, genetic segregation), the mean and standard deviation could be reported where the descriptor is continuous. Where the descriptor is discontinuous, several codes in the

order of frequency could be recorded, or other publicized methods can be utilized, such as Rana *et al.* (1991), or van Hintum (1993), that clearly state a method for scoring heterogeneous accessions;

- (j) dates should be expressed numerically in the format YYYYMMDD, where

YYYY - 4 digits to represent the year
MM - 2 digits to represent the month
DD - 2 digits to represent the day.

PASSPORT

1. Accession descriptors

1.1 Accession number

[MCPD]

This number serves as a unique identifier for accessions and is assigned when an accession is entered into the collection. Once assigned this number should never be reassigned to another accession in the collection. Even if an accession is lost, its assigned number should never be re-used. Letters should be used before the number to identify the genebank or national system (e.g. IDG indicates an accession that comes from the genebank at Bari, Italy; CGN indicates an accession from the genebank at Wageningen, The Netherlands; PI indicates an accession within the USA system)

1.1.1 Local plant number

This identified a single plant within a population of plants having the same accession number. It may be any combination of plot identify, row number, or tree position within the row

1.2 Donor name

Name of the institution or individual responsible for donating the germplasm

1.3 Donor institute code

[MCPD]

Code for the donor institute (see instructions under Institute Code, 1.4)

1.4 Institute code

[MCPD]

Code of the institute where the accession is maintained. The codes consist of 3-letter ISO 3166 country code of the country where the institute is located plus number or an acronym as specified in the institute database that will be made available by FAO. Preliminary codes (i.e. codes not yet incorporated in the FAO Institute database) start with an asterisk followed by a 3-letter ISO 3166 country code and an acronym.

1.5 Curator's name

Name of the officer responsible for maintaining the genetic resources material held at the institute specified in descriptor 1.4 **Institute code**

1.6 Other identification (numbers) associated with the accession

Any other identification (numbers) known to exist in other collections for this accession. Use the following system: INSTCODE:ACCENUMB;INSTCODE:ACCENUMB; INSTCODE and ACCENUMB follow the standard described above and are separated by a colon. Pairs of INSTCODE and ACCENUMB are separated by a semicolon without space. When the institute is not known, the number should be preceded by a colon.

1.7 Scientific name

1.7.1 Genus [MCPD]

Genus name for taxon. Initial uppercase letter required.

1.7.2 Species [MCPD]

Specific epithet portion of the scientific name in lowercase letters. Following abbreviation is allowed: "sp."

1.7.3 Species authority [MCPD]

Provide the authority for the species name.

1.7.4 Subtaxa [MCPD]

Subtaxa can be used to store any additional taxonomic identifier. Following abbreviations are allowed: "subsp." (for subspecies); "convar." (for convariety); "var." (for variety); "f." (for form).

1.7.5 Subtaxa authority [MCPD]

Provide the subtaxa authority at the most detailed taxonomic level.

1.8 Ancestral data

Information about either pedigree or other description of ancestral information (i.e. parent variety in case of mutant or selection).

1.9 Cultivar origin

- 1 Open pollination
- 2 Artificial pollination
- 3 Clonal selection
- 4 Seedling selection

1.10 Accession

1.10.1 Accession name [MCPD]

Either a registered or other formal designation assigned to the accession

1.10.2 Synonyms

Include here any previous identification other than the current name. Collecting number or newly assigned station names are frequently used as identifiers

1.10.3 Common crop name [MCPD]

Name of the crop in colloquial language, preferably English (i.e. 'malting barley', 'cauliflower', or 'white cabbage')

1.11 Acquisition date [YYYYMMDD] [MCPD]

Date on which the accession entered the collection where YYYY is the year MM is the month and DD is the day. Missing data (MM or DD) should be indicated with hyphens. Leading zeros are required.

1.12 Accession size

Number or weight of seeds, seedlings, budsticks, *in vitro* plants, etc. of an accession in the genebank

1.13 Type of material received

- 1 Seed/seedling
- 2 Vegetative/budsticks
- 3 Fruit
- 4 Pollen
- 5 *In vitro* culture
- 99 Other (e.g. more than one type, specify in descriptor **1.14 Notes**)

1.14 Notes

Any additional information may be specified here

2. Collecting descriptors

[MCPD]

2.1 Collecting institute code

Code of the institute collecting the sample. If the holding institute has collected the material, the collecting institute code should be the same as the holding institute code.

2.2 Site number

Number assigned to the physical site by the collector

2.3 Collecting number

[MCPD]

Original number assigned by the collector(s) of the sample, normally composed of the name of initials of the collector(s) followed by a number. This item is essential for identifying duplicates held in different collections.

2.4 Collecting date of sample [YYYYMMDD]

[MCPD]

Collecting date of the samples where YYYY is the year, MM is the month and DD is the day. Missing data (MM or DD) should be indicated with hyphens. Leading zeros are required.

2.5 Country of origin

[MCPD]

Code of the country in which the sample was originally collected. Use the 3 letter ISO 3166-1 extended country codes.

2.6 Province/State

Name of the primary administrative subdivision of the country in which the sample was collected

2.7 Department/County

Name of the secondary administrative subdivision (within a Provision/State) of the country in which the sample was collected

2.8 Location of collecting site

[MCPD]

Location information below the country level that describes where the accession was collected. This might include the distance in kilometers and direction from the nearest town, village or map grid reference point (e.g. 7 km south of Curitiba in the state of Parana).

2.9 Latitude of collecting site¹

[MCPD]

Degree (2 digits) minute (2 digits), and seconds (2 digits) followed by N (North) or S (South) (e.g. 103020S). Every missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required (e.g. 10----S; 011530N; 4531----S)

2.10 Longitude of collecting site

[MCPD]

Degree (3 digits), minutes (2 digits), and seconds (2 digits) followed by E (East) or W (West) (e.g. 07625 low). Every Missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required. (e.g. 076----W).

2.11 Elevation of collecting site [m asl]

[MCPD]

Elevation of collecting site expressed in metres above sea level. Negative values are allowed.

2.12 Collecting/acquisition source

[MCPD]

Coding listed below follows strictly major descriptor states of the MCPD

- 10 Wild habitat
- 20 Farm or cultivated habitat
- 30 Market or shop
- 40 Institute, Experimental station, Research organization, Genebank
- 50 Seed company
- 60 Weedy, distributed or ruderal habitat
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.13 Breeding institute code

[MCPD]

Institute code of the institute that has bred the material. If the holding institute has bred the material, the breeding institute code should be the same as the holding institute code.

¹ To convert from longitude and latitude in degrees (°) minutes ('), seconds (") and a hemisphere (North or South and East or West) to decimal degrees, the following formula should be used:

$$d^{\circ}m's'' = h * (d + m/60 + s/3600)$$

where h=1 for Northern and Eastern hemisphere and -1 for the Southern and Western hemisphere, i.e. 30°30'0"S = -30.5 and 30°15'55"N=30.265.

2.14 Collecting source environment

Use descriptors 6.1.1. to 6.1.26 in section 6

2.15 Number of plants sampled**2.16 Type of sample**

Type of sample collected. If different types of material were collected from the same source, each sample type should be designated with a unique collecting number and a corresponding unique accession number

- 1 Vegetative/budsticks
- 2 Seed/seedling
- 3 Fruit
- 4 Pollen
- 5 Tissue culture (specify which part of the plant is used in descriptor **2.24 Collector's notes**)
- 99 Other (specify which part of the plant is used in descriptor **2.24 Collector's notes**)

2.17 Biological status of accession

[MCPD]

- 100 Wild
- 200 Weedy
- 300 Traditional cultivar/landrace
- 400 Breeding/research material
- 500 Advanced/improved cultivar
- 999 Other (specify in descriptor **2.24 Collector's notes**)

2.18 Ethnobotanical data**2.18.1 Ethnic group**

Name of the ethnic group/community of the farmer donating the sample or of the people living in the area of collecting

2.18.2 Local/vernacular name

Name given by farmer to the crop and cultivar/landrace. State language and dialect if the ethnic group is not provided

2.18.3 Translation

Provide translation of the local name into English, if possible

2.18.4 Litchi varietal name meaning

Does the litchi name have a meaning? If yes, describe it briefly in descriptor **2.24 Collector's notes**

- 0 No
- 1 Yes

2.18.5 History of plant use

- 1 Ancestral/indigenous (Record association with the place and community)
- 2 Introduced (but in unknown distant past)
- 3 Introduced (Record time and details known about introduction)

2.18.6 Parts of the plant used

- 1 Seed
- 2 Root
- 3 Trunk
- 4 Leaf
- 5 Flower/inflorescence
- 6 Fruit
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.18.7 Plant uses

- 1 Food
- 2 Forage
- 3 Fuel
- 4 Medicinal
- 5 Wood/timber
- 6 Dye
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.18.8 Frequency of use of the plant

- 1 Daily
- 2 Weekly
- 3 Occasional
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.18.9 Method of use

- 1 Table fruit
- 2 Mixed fruit
- 3 Preserved
- 4 Processed product
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.18.10 Special uses

- 1 Children
- 2 Older persons
- 3 Feasts
- 4 Religious purpose
- 5 Chiefs
- 6 Aesthetic
- 99 Other (specify in descriptor 2.24 Collector's notes)

2.18.11 Cultural characteristics

Is there folklore associated with the collected litchi type? (e.g. taboos, stories and/or superstitions). If so, describe it briefly in descriptor **2.24 Collector's notes**)

2.18.12 Litchi popularity

Is the variety popular and widely grown? If yes, describe briefly the reasons in descriptor **2.24 Collector's notes**

0 No

1 Yes

2.18.13 Preferred growing conditions

If yes, describe farmers' perceptions on hardness of the variety in relation to main stresses in descriptor **2.24 Collector's notes**

0 No

1 Yes

2.18.14 Prevailing stresses

Information on main associated biotic (pests and diseases) and abiotic (drought) stresses

2.18.15 Cultural methods**2.18.15.1 Cropping system**

- 1 Monoculture (specify spacing)
- 2 Intercropping (specify spacing and type of intercrop)
- 3 Agropastoralism (specify type of animals)
- 4 Natural cropping (i.e. wild types topworked) with cultivar/self sown trees retained in homesteads)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.15.2 Propagation method

Method used to produce trees

- 1 Seed
- 2 Grafting (specify type of grafting and the species, hybrid and/or clone used as rootstock, in descriptor **2.24 Collector's notes**)
- 3 Cutting
- 4 Budding
- 5 Layering
- 6 Stooling
- 7 Tissue culture (specify which part of plant used, in descriptor **2.24 Collector's notes**)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.15.3 Irrigation

- 1 Rainfed
- 2 Irrigated (specify average annual amount of water supplied per hectare)
- 99 Other (specify in descriptor **2.24 Collector's notes**)

2.18.16 Associated flora

Other dominant crop/plant species, including other litchi species, found in and around the collecting site

2.18.17 Seasonality

- 1 Available only in season/at particular period
- 2 Available throughout the year

2.18.18 Market information

Specify if any premium price was assigned to the type of litchi

- 0 No
- 1 Yes

2.18.19 Type of market

- 1 Local
- 2 National
- 3 International

2.19 Collecting site population structure**2.19.1 Number of trees sampled****2.19.2 Frequency of plants at collecting site**

- 3 Low
- 5 Intermediate
- 7 High

2.20 Plant population density

Number of trees per unit area (specify orchard or homestead)

2.21 Genetic erosion

Estimate the rate of genetic erosion of the species occurring in the region of collection

- 1 Slow
- 2 Moderate
- 3 High
- 44 Very high

2.22 Herbarium specimen

Was a herbarium specimen collected? If so, indicate the plant part used and provide an identification number and indicate in which place (Herbarium) the specimen was deposited, in descriptor **2.24 Collector's notes**

0 No

1 Yes

2.23 Photograph

Was photograph(s) taken of the accession or habitat at the time of collecting? If so, provide an identification number(s) in descriptor **2.24 Collector's notes**

0 No

1 Yes

2.24 Collector's notes

Additional information recorded by the collector or any specific information on any state in any of the above descriptors

MANAGEMENT

3. Management descriptors

3.1 Accession number

3.1.1 Local plant number

This identifies a single plant within a population of plants having the same accession number. It may be any combination of plot identify, row number, or tree position within the row

3.2 Population identification

Collecting number, pedigree, cultivar name etc., depending on the population type

3.3 Accession location in orchard

Each separate block designations, row numbers and tree numbers within the row for each duplicate tree of each accession if each tree is not identified with a unique local plant number (see **descriptor 3.1.1**)

3.3.1 Block designation

3.3.2 Row number

3.3.3 Tree number within the row

3.4 Storage address

Building, room, shelf number(s)/field location where stored/maintained

3.5 Storage date [YYYYMMDD]

3.6 Sowing/planting date [YYYYMMDD]

Specify the date on which sowing/planting was done

3.7 Plants/propagules establishment [%]

3.8 Type of maintenance

- 1 Seed
- 2 Vegetative in the field (Field Genebank/Repository/Hortum)
- 3 Vegetative in tissue culture (*In vitro*)
- 4 Pollen
- 5 Cryopreservation
- 99 Other (e.g. more than one type, specify in descriptor **3.12 Notes**)

3.9 Location of safety duplicates

[MCPD]

Code of the institute where a safety duplicate of the accession is maintained.

3.10 *In vitro* conservation**3.10.1 Type of explant**

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 99 Other (specify in descriptor 3.12 Notes)

3.10.2 Date of introduction *in vitro* [YYYYMMDD]**3.10.3 Type of subcultured material**

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 99 Other (specify in descriptor 3.12 Notes)

3.10.4 Regeneration process

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.12 Notes)

3.10.5 Number of genotypes introduced *in vitro***3.10.6 Number of replicates per genotype****3.10.7 Last subculture date [YYYYMMDD]****3.10.8 Medium used at the last subculture****3.10.9 Number of plants at the last subculture****3.10.10 Location after the last subculture****3.10.11 Next subculture date [YYYYMMDD]**

3.11 Cryopreservation

3.11.1 Type of material for cryopreservation

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 8 Ovule
- 99 Other (specify in descriptor 3.12 Notes)

3.11.2 Introduction date in liquid nitrogen [YYYYMMDD]

3.11.3 Number of samples introduced in liquid nitrogen

3.11.4 End of storage period [YYYYMMDD]

3.11.5 Number of samples taken from liquid nitrogen

3.11.6 Type of subcultured material for recovery

(After liquid nitrogen)

- 1 Seed
- 2 Zygotic embryo
- 3 Apical or axillary meristem
- 4 Apical or axillary shoot tip
- 5 Somatic embryo
- 6 Callus
- 7 Cell suspension
- 8 Ovule
- 99 Other (specify in descriptor 3.12 Notes)

3.11.7 Regeneration process

- 1 Organogenesis
- 2 Somatic embryogenesis
- 99 Other (specify in descriptor 3.12 Notes)

3.11.8 Number of recovered samples

3.11.9 Location after the last subculture

3.12 Notes

Any additional information may be specified here

4. Multiplication/regeneration descriptors

4.1 Accession number

4.2 Population identification

Collecting numbers, pedigree, cultivar name etc., depending on the population type

4.3 Field plot number

4.4 Multiplication/regeneration site locations

4.5 Collaborator

4.6 Regeneration year [YYYY]

Year (estimated) when tree should be propagated for regeneration

4.7 Propagation method

Method used to produce trees

- 1 Seed
- 2 Budding
- 3 Grafting
- 4 Layering
- 5 Cutting
- 6 Stooling
- 7 Tissue culture
- 99 Other (specify in descriptor 4.12 Notes)

4.8 Sowing/planting date [YYYYMMDD]

4.9 Cultural practices

4.9.1 Planting density

Number of trees established per hectare

4.9.2 Fertilizer application

Specify type, doses, frequency of each and method of application

4.9.3 Irrigation

Specify amount, frequency and method of application

4.10 Previous multiplication and/or regeneration

4.10.1 Location

4.10.2 Plot number

4.10.3 Sowing/planting date [YYYYMMDD]

4.11 Number of times accession regenerated

Since the date of acquisition

4.12 Notes

Any additional information may be specified here

ENVIRONMENT AND SITE

5. Characterization and/or evaluation site descriptors

5.1 Country of characterization and/or evaluation

(See instructions in descriptor 2.5 Country of origin)

5.2 Site (Research Institute)

5.2.1 Latitude

Degree (2 digits) minute (2 digits), and seconds (2 digits) followed by N (North) or S (South) (e.g. 103020S). Every missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required (e.g. 10----S; 011530N; 4531----S)

5.2.2 Longitude

Degree (3 digits), minutes (2 digits), and seconds (2 digits) followed by E (East) or W (West) (e.g. 07625 low). Every Missing digit (minutes or seconds) should be indicated with a hyphen. Leading zeros are required. (e.g. 076----W).

5.2.3 Elevation [m asl]

5.2.4 Name and address of farm or institute/station/centre

5.3 Evaluator's name and address

5.4 Sowing/grafting/budding/layering stooling date [YYYYMMDD]

5.5 Evaluation environment

Environment in which characterization/evaluation was carried out

- 1 Field
- 2 Screen house
- 3 Glasshouse
- 4 Laboratory
- 5 Other (specify in descriptor 5.16 Notes)

5.6 Condition of tree

Record the condition of the tree at the time of characterization/evaluation

- | | |
|-------------------------|-----------------------------|
| 1 Dying | 5 Mature – vigorous |
| 2 Old – declining | 6 Young (not yet bearing) |
| 3 Mature – diseased | 7 Healthy – cropping poorly |
| 4 Mature – non-vigorous | 8 Healthy – cropping well |

5.7 Seed germination [%]

Specify number of days over which germination is measured

5.8 Grafting/budding/layering/stooling success percentage

Specify number of days over which the success is recorded. Indicate the rootstock

5.9 Number of days to planting after budding/layering [d]**5.10 Field establishment [%]****5.11 Sowing/planting site in the field****5.12 Field spacing****5.12.1 Distance between trees in a row [m]****5.12.2 Distance between rows [m]****5.13 Fertilizer**

Specify types used, doses, frequency of each and method of application

5.14 Plant protection

Specify pesticides used, doses, frequency of each and method of application

5.15 Environmental characteristics of site

Use descriptors 6.1.1. to 6.1.26 in section 6

5.16 Notes

Any other site specific information

6. Collecting and/or characterization/evaluation site environment descriptors**6.1 Site environment****6.1.1 Topography**

This refers to the profile in elevation of the land surface on a broad scale. The reference is FAO (1990)

1	Flat	0-0.5%
2	Almost flat	0.6-2.9%
3	Gently undulating	3-5.9%
4	Undulating	6.0-10.9%
5	Rolling	11.0-15.9%
6	Hilly	16.0-30.0%
7	Steeply dissected	>30%, moderate elevation range
8	Mountainous	>30%, great elevation range (>300 m)
99	Other	(specify in the appropriate section's notes)

6.1.2 Higher level landform (general physiographic features)

The landform refers to the shape of the land surface in the area in which the collecting site is located (Adapted from FAO 1990)

- | | |
|-----------|------------|
| 1 Plain | 5 Upland |
| 2 Basin | 6 Hill |
| 3 Valley | 7 Mountain |
| 4 Plateau | |

6.1.3 Land element and position

Description of the geomorphology of the immediate surroundings of the collecting site (Adapted from FAO 1990; Fig. 1)

- | | |
|----------------------|---|
| 1 Plain level | 17 Interdunal depression |
| 2 Escarpment | 18 Mangrove |
| 3 Interfluve | 19 Upper slope |
| 4 Valley | 20 Mid slope |
| 5 Valley floor | 21 Lower slope |
| 6 Channel | 22 Ridge |
| 7 Levee | 23 Beach |
| 8 Terrace | 24 Beach ridge |
| 9 Floodplain | 25 Rounded summit |
| 10 Lagoon | 26 Summit |
| 11 Pan | 27 Coral atoll |
| 12 Caldera | 28 Drainage line (bottom position in flat or almost-flat terrain) |
| 13 Open depression | 29 Coral reef |
| 14 Closed depression | 99 Other (specify in appropriate section's Notes) |
| 15 Dune | |
| 16 Longitudinal dune | |

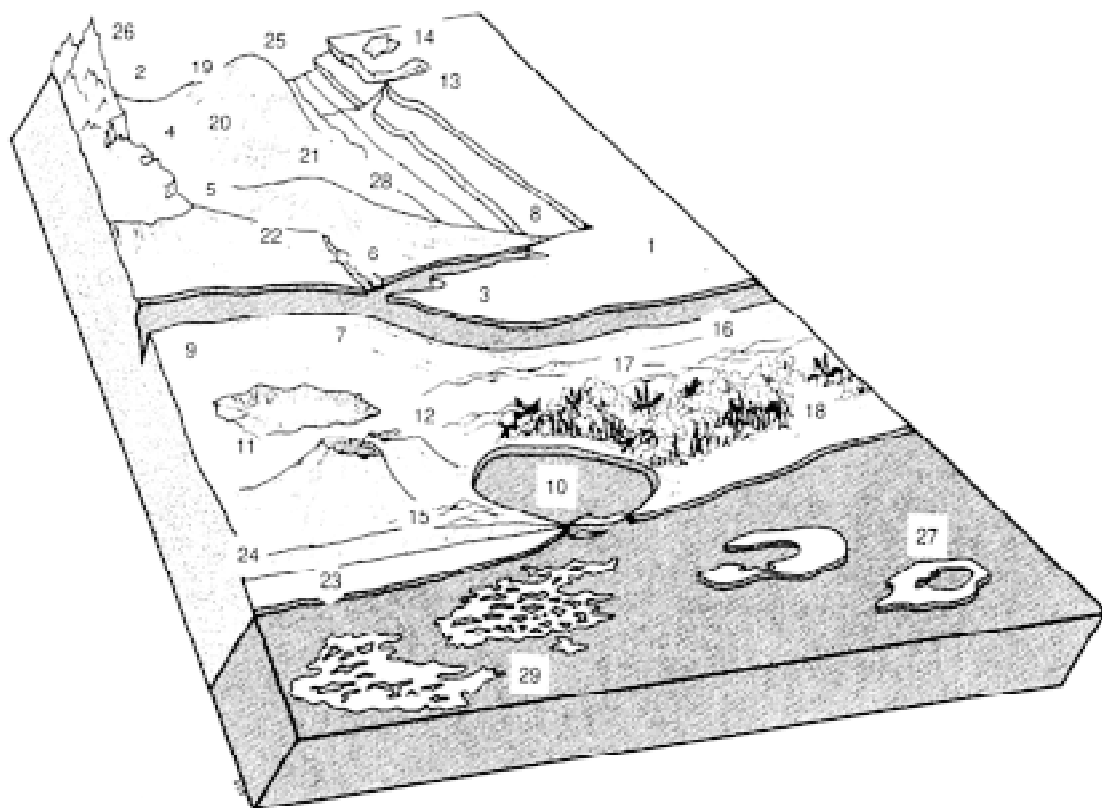


Fig. 1. Land element and position

6.1.4 Slope [°]

Estimated slope of the collecting site

6.1.5 Slope form

It refers to the general shape of the slope in both the vertical and horizontal directions (FAO 1990)

- 1 Straight
- 2 Concave
- 3 Convex
- 4 Terraced
- 5 Complex (irregular)

6.1.6 Slope aspect

The direction that the slope on which the accession was collected faces. Describe the direction with symbols N, S, E, W (e.g. a slope that faces a south-western direction has an aspect of SW)

6.1.7 Crop agriculture

(Adapted from FAO 1990)

6.1.7.1 Tree cropping

- 1 Non-irrigated tree crop cultivation
- 2 Irrigated tree crop cultivation

6.1.8 Overall vegetation surrounding and at the collecting site

(Adapted from FAO 1990)

- 1 Grassland (Grasses, subordinate forbs, no woody species)
- 2 Forbs land (Herbaceous plants predominant)
- 3 Forest (Continuous tree layer, crowns overlapping, large number of tree and shrub species in distinct layers)
- 4 Woodland (Continuous tree layer, crowns usually not touching, understorey may be present)
- 5 Shrub land (Continuous layer of shrubs, crowns touching)
- 6 Savanna (Grasses with a discontinuous layer of trees or shrubs)
- 99 Other (specify in appropriate section's Notes)

6.1.9 Soil parental material

(Adapted from FAO 1990)

Two lists of examples of parent material and rock are given below. The reliability of the geological information and the knowledge of the local lithology will determine whether a general or a specific definition of the parent material can be given. Saprolite is used if the *in situ* weathered material is thoroughly decomposed, clay-rich but still showing rock structure. Alluvial deposits and colluvium derived from a single rock type may be further specified by that rock type.

6.1.9.1 Unconsolidated material

- 1 Aeolian deposits (unspecified)
- 2 Aeolian sand
- 3 Littoral deposits
- 4 Lagoonal deposits
- 5 Marine deposits
- 6 Lacustrine deposits
- 7 Fluvial deposits
- 8 Alluvial deposits
- 9 Unconsolidated (unspecified)
- 10 Volcanic ash
- 11 Loess
- 12 Pyroclastic deposits
- 13 Glacial deposits
- 14 Organic deposits
- 15 Colluvial deposits
- 16 *In situ* weathered
- 17 Saprolite
- 99 Other (specify in appropriate section's Notes)

6.1.9.2 Rock type

(Adapted from FAO 1990)

- | | |
|--------------------------------------|---|
| 1 Acid igneous/
metamorphic rock | 16 Limestone |
| 2 Granite | 17 Dolomite |
| 3 Gneiss | 18 Sandstone |
| 4 Granite/gneiss | 19 Quartzitic sandstone |
| 5 Quartzite | 20 Shale |
| 6 Schist | 21 Marl |
| 7 Andesite | 22 Travertine |
| 8 Diorite | 23 Conglomerate |
| 9 Basic igneous/
metamorphic rock | 24 Siltstone |
| 10 Ultra basic rock | 25 Tuff |
| 11 Gabbro | 26 Pyroclastic rock |
| 12 Basalt | 27 Evaporite |
| 13 Dolerite | 28 Gypsum rock |
| 14 Volcanic rock | 99 Other (specify in
appropriate section's
Notes) |
| 15 Sedimentary rock | 0 Not known |

6.1.10 Stoniness/rockiness/hardpan/cementation

- 1 Tillage unaffected
- 2 Tillage affected
- 3 Tillage difficult
- 4 Tillage impossible
- 5 Essentially paved

6.1.11 Soil drainage

(Adapted from FAO 1990)

- 3 Poorly drained
- 5 Moderately drained
- 7 Well drained

6.1.12 Soil salinity (dissolved salts)

- 1 <160 ppm
- 2 161-240 ppm
- 3 241-480 ppm
- 4 481-800 ppm
- 5 >800 ppm

6.1.13 Quality of the groundwater

- 1 Saline
- 2 Brackish
- 3 Fresh
- 4 Polluted
- 5 Oxygenated
- 6 Stagnating

6.1.14 Soil depth to groundwater table

(Adapted from FAO 1990)

The depth to the groundwater table, if present, as well as an estimate of the approximate annual fluctuation, should be given. The maximum rise of the groundwater table can be inferred approximately from changes in profile colour in many, but not all, soils

- 1 0-25 cm
- 2 25.1-50 cm
- 3 50.1-100 cm
- 4 100.1-150 cm
- 5 >150 cm

6.1.15 Soil moisture

Moisture conditions prevailing in the soil at the time of collecting should be given together with the depth. Attention should be paid to unusual moisture conditions caused by unseasonal weather, prolonged exposure of the profile, flooding, etc. (from FAO 1990)

- 1 Dry
- 5 Slightly moist
- 7 Moist
- 9 Wet

6.1.16 Soil matrix colour

(Adapted from FAO 1990)

The colour of the soil matrix material in the root zone around the accession is recorded in the moist condition (or both dry and moist condition, if possible) using the notation for hue, value and chroma as given in the Munsell Soil Colour Charts (Munsell Colour 1975). If there is no dominant soil matrix colour, the horizon is described as mottled and two or more colours are given and should be registered under uniform conditions. Early morning and late evening readings are not accurate. Provide depth of measurement [cm]. If colour chart is not available, the following states may be used:

- | | |
|-------------------|--------------------|
| 1 White | 9 Yellow |
| 2 Red | 10 Reddish yellow |
| 3 Reddish | 11 Greenish, green |
| 4 Yellowish red | 12 Grey |
| 5 Brown | 13 Greyish |
| 6 Brownish | 14 Blue |
| 7 Reddish brown | 15 Bluish black |
| 8 Yellowish brown | 16 Black |

6.1.17 Soil organic matter content

- 1 Nil (as in arid zones)
- 3 Low (as in long term cultivation in a tropical setting)
- 5 Medium (as in recently cultivated but not yet much depleted)
- 7 High (as in never cultivated, and in recently cleared forest)
- 9 Peaty

6.1.18 Soil pH

Actual value of the soil pH within the following root depths around the accession, record only at one of the following depths:

- 1 pH at 0-10 cm
- 2 pH at 11-20 cm
- 3 pH at 21-30 cm
- 4 pH at 31-60 cm
- 5 pH at 61-90 cm

6.1.19 Soil erosion

- 3 Low
- 5 Intermediate
- 7 High

6.1.20 Rock fragments

(Adapted from FAO 1990)

Large rock and mineral fragments (>2 mm) are described according to abundance

- 1 0-2%
- 2 2.1-5%
- 3 5.1-15%
- 4 15.1-40%
- 5 40.1-80%
- 6 >80%

6.1.21 Soil texture classes

(Adapted from FAO 1990)

For convenience in determining the texture classes of the following list, particle size classes are given for each of the fine earth fraction listed below (Fig. 2):

- | | |
|--------------------|-------------------------|
| 1 Clay | 12 Coarse sandy loam |
| 2 Loam | 13 Loamy sand |
| 3 Clay loam | 14 Loamy very fine sand |
| 4 Silt | 15 Loamy fine sand |
| 5 Silt clay | 16 Loamy coarse sand |
| 6 Silt clay loam | 17 Very fine sand |
| 7 Silt loam | 18 Fine sand |
| 8 Sandy clay | 19 Medium sand |
| 9 Sandy clay loam | 20 Coarse sand |
| 10 Sandy loam | 21 Sand, unsorted |
| 11 Fine sandy loam | 22 Sand, unspecified |

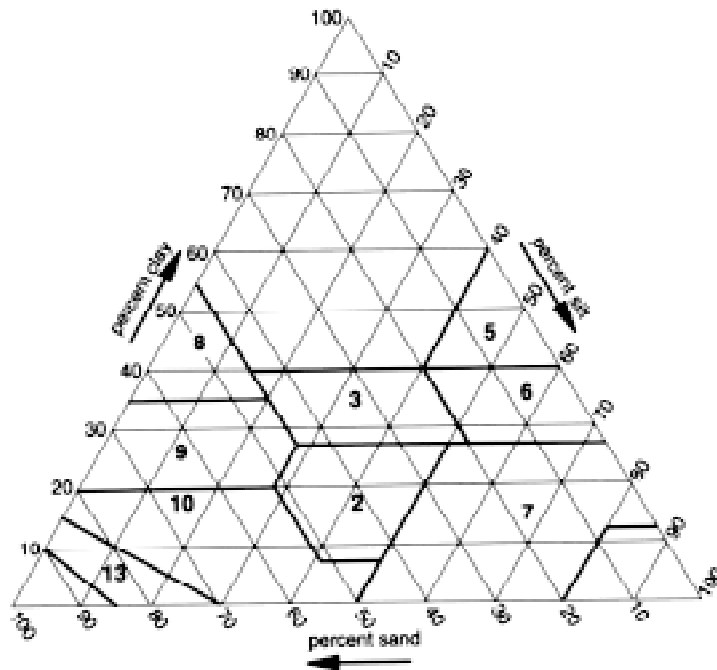


Fig. 2. Soil texture classes

6.1.22 Soil particle size classes

(Adapted from FAO 1990)

1	Clay	<2 mm
2	Fine silt	3-20 mm
3	Coarse silt	21-63 mm
4	Very fine sand	64-125 mm
5	Fine sand	126-200 mm
6	Medium sand	201-630 mm
7	Coarse sand	631-1250 mm
8	Very coarse sand	1251-2000 mm

6.1.23 Soil taxonomic classification

As detailed a classification as possible should be given. This may be taken from a soil survey map. State class (e.g. Alfisols, Spodosols, Vertisols, etc.)

6.1.24 Water availability

- 1 Rain-fed
- 2 Irrigated
- 3 Flooded
- 4 River banks
- 5 Sea coast
- 99 Other (specify in appropriate section's Notes)

6.1.25 Soil fertility

General assessment of the soil fertility based on existing vegetation

- 3 Low
- 5 Moderate
- 7 High

6.1.26 Climate of the site

Should be assessed as close to the site as possible (state number of recorded years)

6.1.26.1 Temperature [°C]

Provide either the monthly or the annual mean

6.1.26.2 Rainfall [mm]

Provide either the monthly or the annual mean (state number of recorded years)

6.1.26.3 Wind

Annual average (state number of years recorded)

6.1.26.3.1 Frequency of typhoons or hurricane force winds

- 3 Low
- 5 Intermediate
- 7 High

6.1.26.3.2 Date of most recent typhoons or hurricane force winds [YYYYMMDD]**6.1.26.3.3 Annual maximum wind velocity [m/s]****6.1.26.4 Frost****6.1.26.4.1 Date of most recent frost [YYYYMMDD]****6.1.26.4.2 Minimum temperature [°C]**

Specify seasonal average and minimum survival temperature

6.1.26.4.3 Duration of temperature below 0°C [d]

6.1.26.5 Relative humidity**6.1.26.5.1 Relative humidity diurnal range [%]****6.1.26.5.2 Relative humidity seasonal range [%]****6.1.26.6 Light**

1 Shady

2 Sunny

6.1.26.7 Day length [h]

Provide either the monthly (mean, maximum, minimum) or the seasonal (mean, maximum, minimum)

CHARACTERIZATION

7. Plant descriptors

Average of at least two 'on-years' (production years) data recorded on ten trees, unless otherwise stated

7.1 Growth descriptors

7.1.1 Tree age [y]

7.1.2 Tree vigour

3 Low

5 Medium

7 High

7.1.3 Tree height [m]

From ground level to the top of the tree (if grafted, record also height of graft union and rootstock name). Evaluate only unpruned trees

7.1.4 Trunk circumference [cm]

Recorded at 50 cm above ground level for trees raised through seedlings/air layering/grafting

7.1.5 Trunk surface

1 Smooth

2 Rough

3 Very rough

7.1.6 Crown diameter [m]

Measured as the mean diameter using two directions (North-South and East-West)

7.1.7 Tree volume [m³]

Calculated with the use of formula $\frac{4}{3} \pi a^2 b$ (where a = half of the spread, b= half of the height)

7.1.8 Crown shape

(See Fig. 3)

- 1 Pyramidal
- 2 Broadly pyramidal
- 3 Spherical
- 4 Oblong
- 5 Semicircular
- 6 Dome shaped
- 7 Irregular
- 99 Other (specify in descriptor 7.6 Notes)

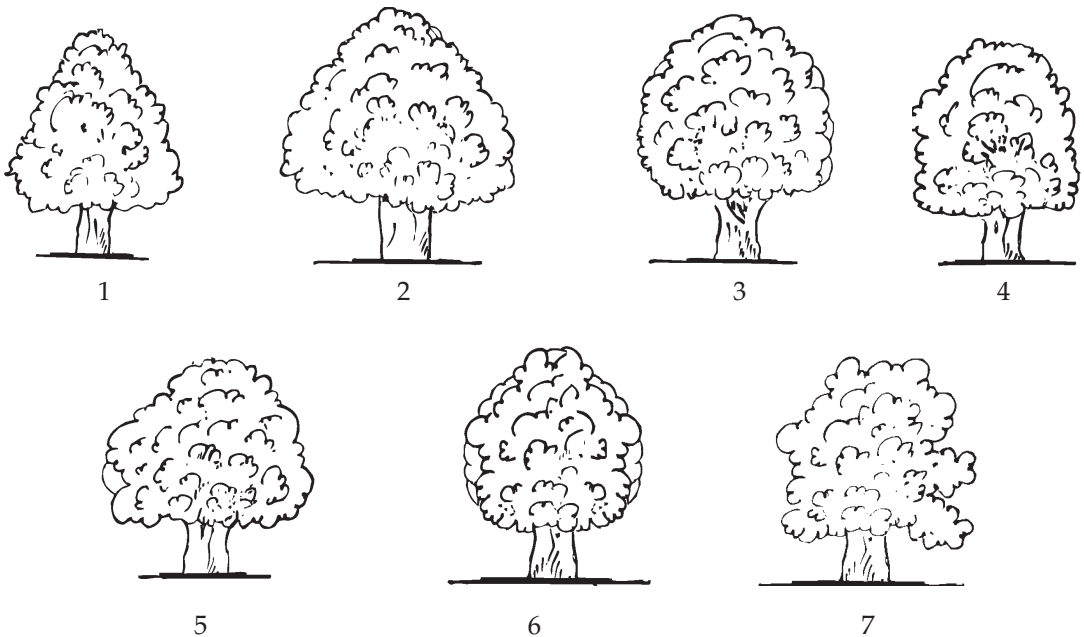


Fig. 3. Crown shape

7.1.9 Tree growth habit

- 1 Erect/upright
- 2 Semi-erect
- 3 Spreading
- 4 Drooping
- 99 Other (specify in descriptor 7.6 Notes)

7.1.10 Branching density

- 3 Sparse
- 4 Medium
- 7 Dense

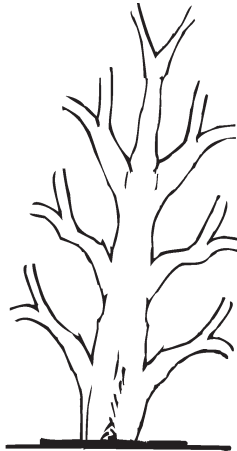
7.1.11 Branching pattern

(See Fig. 4)

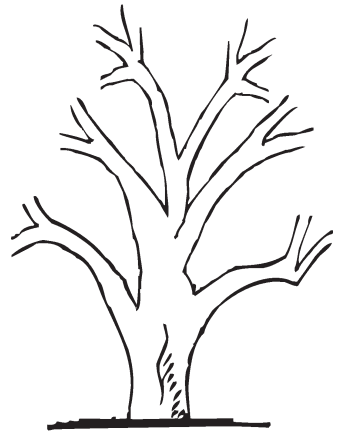
- 1 Erect
- 2 Opposite
- 3 Verticillate
- 4 Horizontal
- 5 Irregular



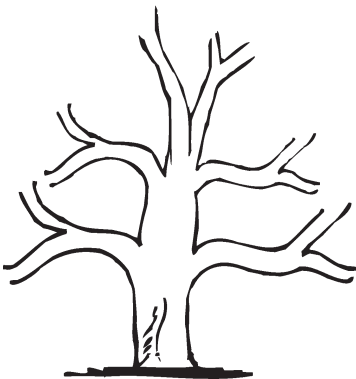
1



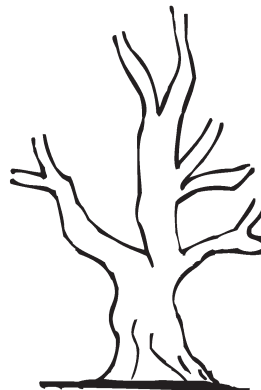
2



3



4



5

Fig. 4. Branching pattern

7.1.12 Young shoot pubescence

- 1 Glabrous
- 2 Pubescent

7.2 Leaf descriptors

Average of 20 fully expanded representative leaves, collected from three trees when shoots are lignified. Do not select leaves that are abnormal due to the disease, nutritional imbalances and excessive vigour. For qualitative characteristics, indicate the predominant one.

7.2.1 Young leaf colour

Evaluated newly emerged leaf at fully expanded stage

- 1 Light green
- 2 Yellowish green
- 3 Green
- 4 Light purple
- 5 Purple
- 6 Pinkish green
- 7 Reddish brown
- 99 Other (specify in descriptor 7.6 Notes)

7.2.2 Mature leaf colour

Evaluated at adaxial side, at fully mature stage

- 1 Light green
- 2 Green
- 3 Dark green
- 4 Pinkish green
- 99 Other (specify in descriptor 7.6 Notes)

7.2.3 Number of leaflets per leaf

Average number of leaflets from 10 leaves to be recorded

7.2.4 Arrangement of leaflets (Phyllotaxy)

- 1 Alternate
- 2 Opposite

7.2.5 Rachis length [mm]

To be recorded from stem to the last leaflet

7.2.6 Length of petiole (leaflet stalk) [mm]

To be recorded from the rachis to the base of the leaflet blade

7.2.7 Leaflet blade length [cm]

Measured from the base to the tip of the leaf blade

7.2.8 Leaflet blade width [cm]
Measured at the widest point

7.2.9 Leaflet blade shape
(See Fig. 5)

- 1 Lanceolate
- 2 Ovate
- 3 Obovate
- 4 Elliptic
- 5 Oblong
- 99 Other (specify in descriptor 7.6 Notes)

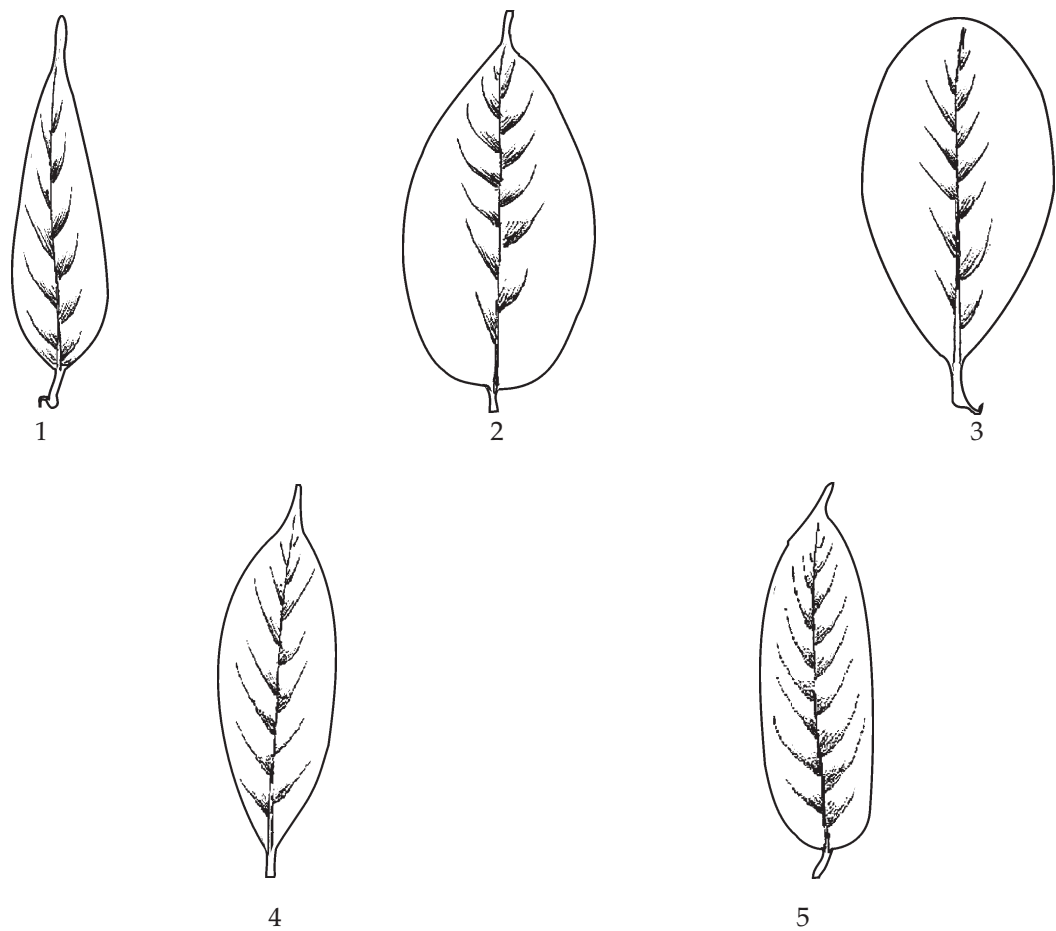


Fig. 5. Leaf blade shape

7.2.10 Leaflet apex shape

(See Fig. 6)

- 1 Acute
- 2 Acuminate
- 99 Other (specify in descriptor 7.6 Notes)



1



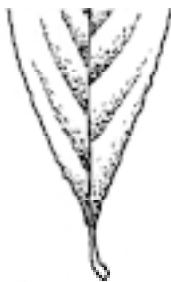
2

Fig. 6. Leaflet apex shape

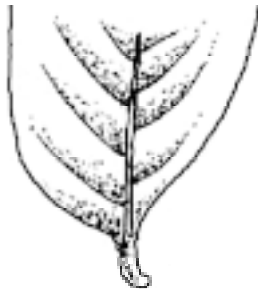
7.2.11 Leaflet base shape

(See Fig. 7)

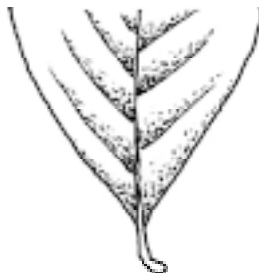
- 1 Attenuate
- 2 Oblique
- 3 Cuneate
- 4 Obtuse
- 99 Other (specify in descriptor 7.6 Notes)



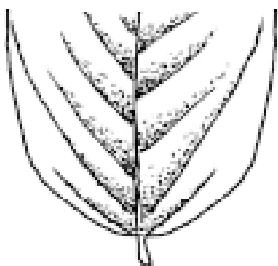
1



2



3



4

Fig. 7. Leaflet base shape

7.2.12 Leaflet upper surface pubescence

- 0 Absent
- 1 Present

7.2.13 Leaflet lower surface pubescence

- 0 Absent
- 1 Present

7.2.14 Leaflet midrib appearance

- 1 Not prominent
- 2 Slightly prominent
- 3 Prominent

7.2.15 Leaflet venation appearance

- 1 Not prominent
- 2 Slightly prominent
- 3 Prominent

7.2.16 Leaflet curvature

- 1 Curve upward from the midrib
- 2 Curve downward along the margin
- 3 Flat, no curve
- 4 Curve down slightly at the top
- 99 Other (specify in descriptor 7.6 Notes)

7.2.17 Date of initiation of new flushes [YYYYMMDD]

Recorded when plant gives new extension growth

7.2.18 Protuberances on petiole

- 0 Absent
- 1 Present

7.3 Inflorescence descriptors

Average of at least two 'on years' data. Recorded at bloom period

7.3.1 Flowering precocity [y]

Specify number of years from budding/layering/grafting/seed sowing to first flower (i.e. 4 B/L/G/S indicates first flower produced 4 years after field establishment from the date of budding/layering/grafting/seed sowing, respectively)

7.3.2 Date of first and last panicle initiation [YYYYMMDD]**7.3.3 Date of opening of first and last male flower [YYYYMMDD]**

7.3.4 Date of opening of first and last pseudo-hermaphrodite flower (functional male) [YYYYMMDD]

7.3.5 Date of opening of first and last non-functional pseudo-hermaphrodite flower (functional female) [YYYYMMDD]

7.3.6 Flower composition in inflorescence

Average of ten inflorescences to be recorded

- 1 Number of male flowers
- 2 Number of pseudo-hermaphrodite flowers
- 3 Number of functional hermaphrodite flowers

7.3.7 Flower disc/inflorescence colour

- 1 Light cream
- 2 Light yellow
- 3 Dark yellow
- 4 Pinkish
- 99 Other (specify in descriptor 7.6 Notes)

7.3.8 Duration of flowering [d]

Calculated from days to first flower opening to days to last flower opening

7.3.9 Flower size

- 1 Small
- 2 Medium
- 3 Large

7.3.10 Position of inflorescence

- 1 Terminal
- 2 Axillary
- 3 Both

7.3.11 Length of inflorescence

Measured from the base to the tip of the inflorescence. Average of 10 inflorescences

7.3.12 Width of inflorescence

Measured at the widest point. Average of 10 inflorescence

7.3.13 Abundance of flowers

- 1 Profuse
- 2 Moderate
- 3 Sparse

7.4 Fruit descriptors

Recorded on well-developed 20 fruits at harvest time, unless otherwise specified

7.4.1 Number of years to first fruiting after sowing/planting [y]

7.4.2 Date of initiation and end of fruit set [YYYYMMDD]

7.4.3 Number of days from fruit set to fruit maturity [d]

7.4.4 Fruit maturity

7.4.4.1 Start of fruit maturity [YYYYMMDD]

7.4.4.2 End of fruit maturity [YYYYMMDD]

7.4.4.3 Duration of fruit maturity [d]

7.4.5 Fruit maturity group

- 1 Early
- 2 Medium
- 3 Late

7.4.6 Fruit ripening

- 1 Synchronous ripening
- 2 Non-synchronous ripening

7.4.7 Fruit bearing habit

- 1 Regular
- 2 Alternate years
- 3 Irregular
- 99 Other (specify in descriptor 7.6 Notes)

7.4.8 Fruit bearing intensity

- 1 Poor
- 2 Medium
- 3 Heavy

7.4.9 Fruit clustering habit

Specify number of trees evaluated per accession

- 1 Solitary
- 2 Clusters
- 99 Other (specify in descriptor 7.6 Notes)

7.4.10 Number of fruits per cluster/inflorescence**7.4.11 Fruit shape**

Specify number of fruits evaluated. (See Fig. 8)

- 1 Round
- 2 Oval
- 3 Oblong
- 4 Conical
- 5 Elliptic
- 6 Cordate
- 7 Long cordate
- 99 Other (specify in descriptor 7.6 Notes)

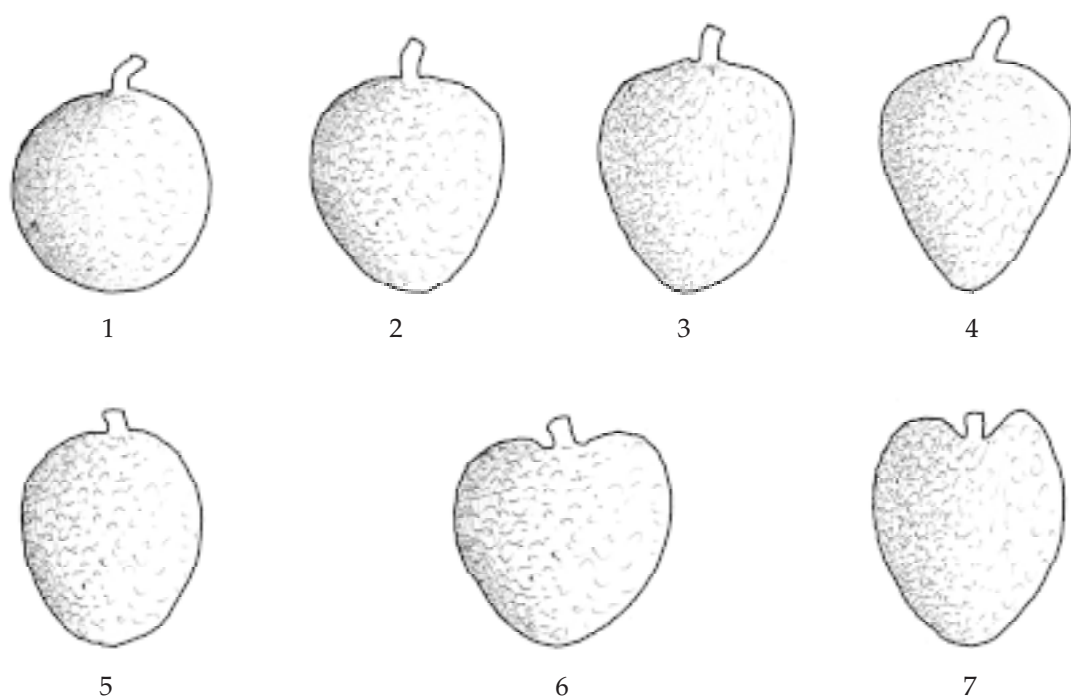


Fig. 8. Fruit shape

7.4.12 Fruit shoulders

- 1 Even/smooth
- 2 Protruding



Fig. 9. Fruit shoulders

7.4.13 Fruit tip

(See Fig. 10)

- 1 Round
- 2 Obtuse
- 3 Acute

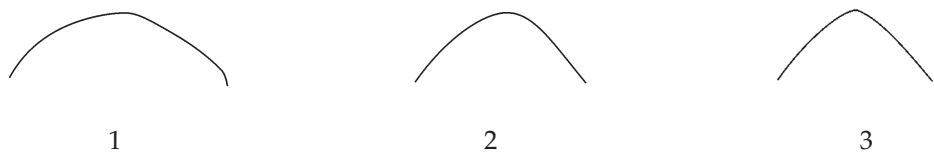


Fig. 10. Fruit tip

7.4.14 Fruit segments

(See Fig. 11)

- 1 Sharp pointed
- 2 Nipple shaped
- 3 Swelling type
- 4 Smooth



Fig. 11. Fruit segments

7.4.15 Fruit length [cm]

Average of ten fruits

7.4.16 Fruit diameter [cm]

Measured at the widest point. Average of ten fruits

7.4.17 Fruit weight [g]

Average of ten fruits

7.4.18 Cracking/splitting of fruit skin

- 1 Not prone to cracking
- 2 Prone to cracking
- 3 Highly prone to cracking

7.4.19 Fruit skin thickness

- 1 Thin
- 2 Medium
- 3 Thick
- 4 Very thick

7.4.20 Mature fruit colour

Recorded at maturity

- 1 Green
- 2 Greenish yellow
- 3 Greenish red
- 4 Pinkish red
- 5 Crimson
- 6 Red
- 7 Reddish yellow
- 8 Dark red
- 9 Purple red
- 10 Rosy red
- 11 Deep orange
- 12 Deep pink
- 99 Other (specify in descriptor 7.6 Notes)

7.4.21 Distribution of colour on fruit surface

- 1 Uniform
- 2 Partial

7.4.22 Shape of tubercles/protuberances

(See Fig. 12) Observed on surface of mature fruit

- 1 Slightly pointed
- 2 Sharp pointed
- 3 Extremely sharp pointed

- 4 Wedge
- 5 Obtuse
- 6 Smooth
- 7 Cuneate

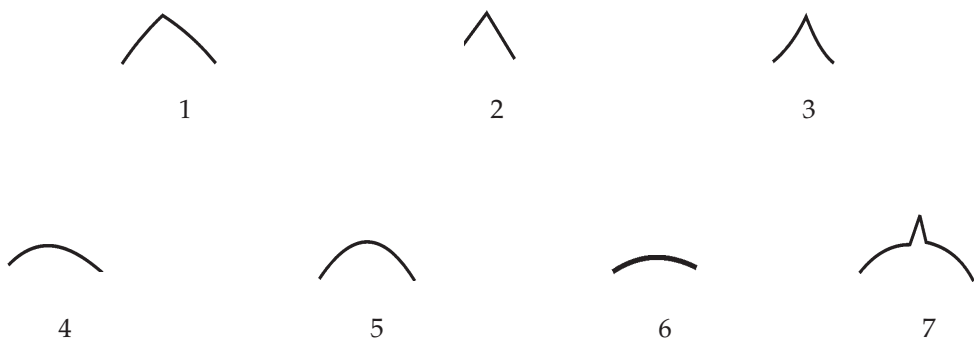


Fig. 12. Shape of tubercles/protuberances

7.4.23 Tubercle density

Recorded at fruit maturity

- 3 Sparse
- 5 Medium
- 7 Dense

7.4.24 Presence of suture

- 0 Absent
- 3 Weak (visible, if noticed carefully)
- 7 Prominent (easily visible)

7.4.25 Fruit attractiveness

Combined assessment of shape, size and appearance, etc.

- 1 Poor
- 2 Intermediate
- 3 Good
- 4 Excellent

7.4.26 Shelf life [d]

Number of days fruit remains in good condition under storage at room temperature

7.4.26.1 With colour retaining**7.4.26.2 After peel browning****7.4.27 Weight of aril [g]**

Measured on ten fruits

7.4.28 Aril thickness [mm]

- 1 Thin
- 2 Medium
- 3 Thick

7.4.29 Aril texture

Recorded on fully ripe fruits

- 1 Soft (succulent/fleshy)
- 2 Firm
- 3 Coarse
- 4 Fibrous
- 5 Melting
- 6 Leathery
- 7 Crisp
- 8 Extremely crisp
- 99 Other (specify in descriptor 7.6 Notes)

7.4.30 Aril nutritive value

Recorded on fully ripe fruits

7.4.30.1 Total sugars [%]**7.4.30.2 Total soluble solids [°Brix]****7.4.30.3 Vitamin C [mg/100 g pulp]****7.4.30.4 Acidity [%]****7.4.30.5 TSS/acidity ratio****7.4.31 Aril quality**

Combined assessment of taste, flavour, juiciness and eye appeal

- 1 Insipid
- 2 Acid
- 3 Bitter
- 4 Sweet
- 99 Other (specify in descriptor 7.6 Notes)

7.4.32 Aril flavour

Assessed at the time of opening ripe fruit

- 1 Weak
- 2 Intermediate
- 3 Strong

7.4.33 Aril juiciness

- 0 Not juicy
- 1 Juicy
- 2 Very juicy

7.4.34 Aril colour

Recorded at the ripe stage

- 1 White
- 2 Dull white
- 3 Creamy white
- 4 Creamy yellow
- 5 Yellow
- 6 Pearl white
- 7 Waxy white
- 8 Waxy yellow
- 99 Other (specify in descriptor 7.6 Notes)

7.5 Seed descriptors**7.5.1 Seed length [cm]**

Average of 20 seeds

7.5.2 Seed width [cm]

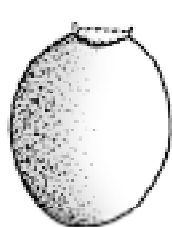
Average of 20 seeds at the widest point

7.5.3 100-Seed weight [g]

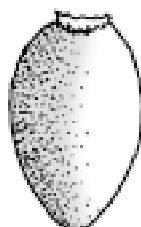
7.5.4 Seed shape

(See Fig. 13)

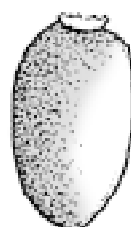
- 1 Round
- 2 Oval
- 3 Oblong
- 4 Elongate
- 5 Chicken tongue
- 6 Irregular
- 99 Other (specify in descriptor 7.6 Notes)



1



2



3



4



5



6

Fig. 13. Seed shape**7.5.5 Seed coat colour**

- 1 Off-white
- 2 Creamish
- 3 Dull brown
- 4 Brown
- 5 Dark brown
- 99 Other (specify in descriptor 7.6 Notes)

7.6 Notes

Any additional information may be specified here

EVALUATION

8. Plant descriptors

8.1 Fruit

8.1.1 Yield per tree [kg per year]

8.1.2 Fruit availability [d]

Number of days from the first to the last harvest date

8.1.3 Maturity period

- 1 Early
- 2 Intermediate
- 3 Late

8.1.4 Fruit bearing

- 3 Poor
- 5 Medium
- 7 Heavy

8.1.5 Fruit quality at storage [d]

Number of days of storage under ambient conditions

8.2 Aril

8.2.1 Chemical composition

8.2.1.1 Aril sugar content [%]

8.2.1.2 Aril acidity content [%]

8.2.1.3 Vitamin C content [mg/100g pulp]

8.3 Notes

Specify here any other additional information

9. Abiotic stress susceptibility

Scored under artificial and/or natural conditions, which should be clearly specified. These are coded on a susceptibility scale from 1 to 9, viz.:

9.1 Reaction to higher temperature

9.1.1 Sunburn susceptibility of fruit

- 0 Not susceptible
- 3 Low
- 5 Medium
- 7 High
- 9 Very high

9.2 Reaction to soil salinity

9.3 Reaction to mineral toxicity

- 1 Boron
- 2 Zinc
- 3 Chloride
- 4 Copper
- 5 Calcium
- 6 Iron
- 99 Other (specify in descriptor 9.7 Notes)

9.4 Reaction to waterlogging

9.5 Reaction to drought

9.6 Reaction to constant winds

9.7 Notes

Specify here any additional information

10. Biotic stress susceptibility

In each case, it is important to state the origin of the infestation or infection, i.e. natural, field inoculation, and laboratory. Also specify the causal organism and the corresponding symptoms. Record such information in descriptor 10.3 Notes. These are coded on a susceptibility scale from 1 to 9, viz.:

- 1 Very low or no visible sign of susceptibility
- 3 Low
- 5 Intermediate
- 7 High
- 9 Very high

10.1 Pests

10.1.1	<i>Acrocercops hierocosma</i>	Leaf minor
10.1.2	<i>Acrocercops cramerella</i>	Fruit borer
10.1.3	<i>Indarbela tetraonis</i>	Bark eating caterpillar
10.1.4	<i>A. illipida</i>	Fruit borer
10.1.8	<i>Cocoecia epicyrta</i>	Leaf damaging
10.1.9	<i>Chlumetia transversa</i>	Shoot tip boring
10.1.10	<i>Lymantria mathura</i>	Leaf damaging
10.1.11	<i>Ephestia cautella</i>	Fruit borer
10.1.12	<i>Myllocerus</i> sp.	Leaf cutting weevil
10.1.13	<i>Anoplophora macularia</i>	Trunk boring
10.1.14	<i>Cryptocephalum</i> sp.	Leaf damaging
10.1.15	<i>Conopomorpha cramerella</i>	Fruit borer
10.1.16	<i>Megaleurothrips eusitatus</i>	Flower damaging
10.1.17	<i>Toxoptera aurantii</i>	Aphid
10.1.18	<i>Chrysocoris stolii</i>	Litchi bug
10.1.19	<i>Tessaratomya quadrata</i>	Litchi bug
10.1.20	<i>Dacus dorsalis</i>	Fruit borer
10.1.21	<i>Acerya litchi</i>	Leaf curling
10.1.22	<i>Oligonychus mangiferus</i>	Leaf damage

10.2 Diseases

10.2.1	<i>Botryodiplodia theobromae</i>	Spot in leaf, fruit and flower
10.2.2	<i>Cephaleuros virens</i>	Leaf spot disease
10.2.3	<i>Colletotrichum gleosporioides</i>	Fruit rot
10.2.4	<i>Pestalotia pauciseta</i>	Spot on leaf and fruit
10.2.5	<i>Dictyoarthrinium</i> sp.	Twig blight
10.2.6	<i>Fusarium</i> sp.	Flower blight

10.3 Notes

Specify here any additional information

11. Biochemical markers [specify methods used and cite reference(s)]

11.1 Isozymes

For each enzyme, indicate the tissue analysed and the zymogram type. A particular enzyme can be recorded as 11.1.1; 11.1.2, etc. Examples include: Acid phosphate (ACPH); Esterases and (EST A and B); Isocitrate dehydrogenase (ICD); Malate dehydrogenase (MDH); Phosphogluconate dehydrogenase (PGD); Phosphoglucose isomerase (PGI); Phosphoglucose mutase (PGM); Peroxidases

11.2 Other biochemical markers

(e.g. Polyphenol profile)

12. Molecular markers

Describe any specific discriminating or useful trait for this accession. Report probe-enzyme combination analysed. Below are listed some of the basic methods most commonly used.

12.1 Restriction fragment length polymorphism (RFLP)

Report probe/enzyme combination (approach can be for nuclear, chloroplast or mitochondrial genomes)

12.2 Amplified fragment length polymorphism (AFLP)

Report primer pair combinations and accurate molecular size of products (used for nuclear genomes)

12.3 DNA amplification fingerprinting (DAF); random amplified polymorphic DNA (RAPD); AP-PCR

Accurately report experimental conditions and molecular size of products (used for nuclear genomes)

12.4 Sequence-tagged microsatellites (STMS)

Report primer sequences, and accurate product sizes (can be used for nuclear or chloroplast genomes)

12.5 PCR-sequencing

Report PCR primer sequences, and derived nucleotide sequence (can be used for single copy nuclear, chloroplast or mitochondrial genomes)

12.6 Other molecular markers

13. Cytological characters

13.1 Chromosome number

13.2 Ploidy level

(2x, 3x, 4x, etc. and aneuploidy)

13.3 Meiosis chromosome associations

Average of 50 microscope mother cells, observed during metaphase 1

13.4 Other cytological characters

14. Identified genes

Describe any known specific mutant present in the accession

BIBLIOGRAPHY

- American Phytopathological Society. 1994. Common names for plant diseases. Am. Phytopathol. Soc., St. Paul MN, USA.
- CAB International. 1999. Crop Protection Compendium. CD-ROM. CAB International, UK.
- FAO. 1990. Guidelines for Soil Profile Description, 3rd edition (revised). Food and Agriculture Organization of the United Nations, International Soil Reference Information Centre, Land and Water Development Division. FAO, Rome.
- Ghosh, S.P. and S.K. Mitra. 2000. Status Report on Genetic Resources of Litchi in India, Thailand and Myanmar. 56p.
- Henderson, I.F. 1989. Henderson's Dictionary of Biological Terms. Tenth Edn., Eleanor Lawrence (ed.) Longman Scientific & Technical, Harlow, Essex, England.
- Hong Lin Tai, Yuan Pei Yeran, On Liang Xi, Chen Jie Zhen and Li Tian Shu, 1996. Status Report on Genetic Resources of Litchi in China. IPGRI Project No. B06. Pomological Research Institute, Chinese Academy of Agricultural Sciences, China. 19p.
- Kornerup, A. and J.H. Wanscher. 1984. Methuen Handbook of Colour. Third edition. Methuen, London.
- Munsell Color. 1975. Munsell Soil Color Chart. Munsell Color, Baltimore, MD, USA.
- Munsell Color. 1977. Munsell Color Charts for Plant Tissues, 2nd edition, revised. Munsell Color, Macbeth Division of Kollmorgen Corporation, 2441 North Calvert Street, Baltimore, MD 21218, USA.
- Rana, R.S., R.L. Sapra, R.C. Agrawal and Rajeev Gambhir. 1991. Plant Genetic Resources. Documentation and Information Management. National Bureau of Plant Genetic Resources (Indian Council of Agricultural Research). New Delhi, India.
- Royal Horticultural Society. 1966, c. 1986. R.H.S. Colour Chart (edn. 1, 2). Royal Horticultural Society, London.
- Stearn, William T. 1995. Botanical Latin. Fourth Edition. David & Charles Publishers, Newton Abbot, UK.
- van Hintum, Th.J.L. 1993. A computer compatible system for scoring heterogeneous populations. Genet. Resour. & Crop Evol. 40:133-136.

CONTRIBUTORS

Authors

Dr Mathura Rai
Sr. Scientist and Officer on Special Duty
Horticulture & Agro-forestry Research
Programme
ICAR Research Complex
Plandu, Tata Road, P.O. Rajaulatu
Ranchi – 834 010, Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

Dr (Ms.) Nguyen Thi Ngoc Hue
Deputy Head - PGR Centre
Vietnam Agricultural Science Institute
Thanh Tri
Vandien, Hanoi,
Vietnam
Tel: +84-4-8614326
Fax: +84-4-8613937
Email: ntngochue@hn.vnn.vn

Dr Bhag Mal
Coordinator for South Asia
IPGRI Office for South Asia
Pusa Campus
New Delhi 110 012
India
Tel: +91-11-25827546/25827547
Fax: +91-11-25819899
Email: b.mal@cgiar.org

Reviewers

Dr R.K. Arora
Honorary Research Fellow
IPGRI, Office for South Asia,
CG Centres Block
National Agriculture Science Centre
Pusa Campus, DPS Marg
New Delhi – 110 012
India
Tel: +91-11-25827546/25827547
Fax: +91-11-25819899
Email: r.arora@cgiar.org

Ms Chen Jieshen
Litchi Research Lab
Institute of Pomology of Guangdong
Academy of Agricultural Sciences
Guangzhou, Guangdong
P.R. China
Tel: +86-20-38765552

Dr H.P. Singh
Horticulture Commissioner
Department of Agriculture & Cooperation
Ministry of Agriculture
Krishi Bhawan
New Delhi-110 001
India
Tel: +91-11-23381012
Fax: +91-11-23384978
E-mail: hpsingh@krishi.delhi.nic.in
hpsingh@123india.dot.com

Dr Sisir K. Mitra
 Professor, Department of Fruits and
 Orchard Management
 Faculty of Horticulture
 Bidhan Chandra Krishi Viswavidyalaya
 (BCKV)
 P.O. Krishi Viswavidyalaya
 Mohanpur 741252
 Nadia, West Bengal
 India
 Tel: +91-33-25823017
 Fax: +91-33-25828460
 E-mail: sisirm@vsnl.net

Dr Nipat Sukhvibul
 Horticulturist
 Chiang-Rai 57000,
 Thailand
 Tel: +66-053-714023
 Fax: +66-053-714024
 E-mail: sukhvibuln@yahoo.com

Dr Felipe S. dela Cruz
 University Researcher and Head
 Fruit & Ornamental Crops Division
 National Plant Genetic Resources
 Laboratory (NPGRL)
 Institute of Plant Breeding (IPB)
 Los Baños
 Philippines
 Tel: +63-49-5362298
 Fax: +63-49-5363438
 Email: fsdcj@ipb.uplb.edu.ph

Dr D.S. Rathore
 ADG (Hort), ICAR
 Krishi Bhavan,
 Rajendra Prasad Road,
 New Delhi – 110 012
 India
 Tel: +91-11-25732467
 Fax: +91-11-25772029

Dr Room Singh
 Div of Fruits and Horticultural
 Technology
 ICAR, Pusa Campus
 New Delhi – 110 012
 India
 Tel: +91-11-25785214

Dr G.S. Prakash
 Principal Scientist and Head
 Division of Fruit Crops, IIHR
 Hesaraghatta Lake Post
 Bangalore – 560 089
 India
 Tel: +91-80-8466420-423
 Fax: +91-80-8466291

Dr Dinesh
 Sr. Scientist (Hort.)
 Division of Fruit Crops, IIHR
 Hesaraghatta Lake Post
 Bangalore – 560 089
 India
 Tel: +91-80-8466420-423
 Fax: +91-80-8466291

Ms C. Vasugi
 Scientist (Hort.)
 Division of Plant Genetic Resources,
 Indian Institute of Horticultural Research,
 Hesaraghatta Lake Post,
 Bangalore - 560 089
 India
 Tel: +91-80-8466420-423
 Fax: +91-80-8466291

Liangxi Ou
 Fruit Research Institute of Guang Dong
 Academy of Agricultural Science
 Guang Zhou City, Guang Dong Province
 China

Dr P.K. Ray,
Associate Professor & Sr. Scientist (Fruits)
Horticulture Department
Rajendra Agriculture University
Pusa, Samastipur
Bihar
India
Tel: +91-6274-274226
Fax: +91-6274-274255

Dr Bikash Das,
Scientist (Horticulture),
Horticulture & Agro-forestry Research
Programme
ICAR Research Complex
Plandu, Tata Road, P.O. Rajaulatu
Ranchi – 834 010
Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

Dr S.N. Pandey
Head, Division of Fruit and Horticulture
Technology,
IARI, Pusa campus
New Delhi – 110 012
India
Tel: +91-11-25785214

Dr C. Singh
Professor & Head,
Department of Horticulture,
Bihar Agriculture University,
Ranchi, Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

Dr S. Kumar
Principal scientist (Pl. Path.)
Horticulture & Agro-forestry Research
Programme
ICAR Research Complex
Plandu, Tata Road, P.O.Rajaulatu
Ranchi – 834 010, Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

Dr Pradip Dey
Sr. Scientist
Horticulture & Agro-forestry Research
Programme
ICAR Research Complex
Plandu, Tata Road, P.O.Rajaulatu,n
Ranchi – 834 010, Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

Dr Rajesh Kumar
Sr. Scientist,
NRC for Litchi
Plandu, Tata Road, P.O.Rajaulatu
Ranchi – 834 010, Jharkand
India
Tel: +91-651-2260141
Fax: +91-651-2260101

ACKNOWLEDGEMENTS

IPGRI wishes to warmly acknowledge the many scientists around the world who have contributed directly or indirectly to the development of the Descriptors for litchi (*Litchi chinensis*).

Dr Bhag Mal of IPGRI-APO coordinated the development and review of this publication with support from Ms Y.S. Ramamani and Dr Paul Quek. Ms Adriana Alercia supervised the production of the text up to the publication stage and provided scientific and technical expertise. Ms Jennie Draw proofread the text.

Annex I

COLLECTING FORM for litchi (*Litchi chinensis*)**SAMPLE IDENTIFICATION**

COLLECTING INSTITUTE CODE (2.1):

COLLECTING No. (2.3):

PHOTOGRAPH (2.23):

COLLECTING DATE (YYYY/MM/DD) (2.4):

GENUS (1.7.1):

SPECIES (1.7.2):

COLLECTING SITE LOCATION

COUNTRY (2.5):

PROVINCE/STATE (2.6):

DEPARTMENT/COUNTY (2.7):

LOCATION (2.8):

km:

direction:

from:

LATITUDE (2.9):

LONGITUDE (2.10):

ELEVATION (2.11):m asl

COLLECTING SITE ENVIRONMENT

COLLECTING SOURCE (2.12):

10 Wild habitat

20 Farm or cultivated habitat

30 Market or Shop

40 Institute, Experimental station, Research organization, Genebank

50 Seed company

60 Weedy, distributed or ruderal habitat

99. Other (specify):

HIGHER LEVEL LANDFORM (6.1.2):

1. Plain

2. Basin

3. Valley

4. Plateau

5. Upland

6. Hill

7. Mountain

SLOPE [°] (6.1.4):

SLOPE ASPECT (6.1.6): (code N,S,E,W)

SOIL FERTILITY (6.1.25):

(code: 3=Low ; 5=Moderate; 7=High)

SOIL TEXTURE CLASSES (6.1.21):

State class (e.g. Clay, Loam, Silt)

SOIL TAXONOMIC CLASSIFICATION (6.1.23):

State class (e.g. Alfisols, Spodosols, Vertisols)

WATER AVAILABILITY (6.1.24):

1. Rainfed

2. Irrigated

3. Flooded

4. River banks

5. Sea coast

99. Other (specify):

RAINFALL (6.1.26.2):

Annual mean:

mm

Monthly mean (mm):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

TEMPERATURE (6.1.26.1):

Seasonal mean:

°C

Monthly mean (°C):

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

SAMPLE

BIOLOGICAL STATUS OF ACCESSIONS (2.17):

100 Wild

200 Weedy

300 Traditional cultivar/landrace

400 Breeding/research material

500 Advanced/improved cultivar

999 other (specify)

TYPE OF SAMPLE (2.16):

1. Vegetative/budsticks

2. Seed/seedling

3. Fruit

4. Pollen

5. Tissue culture

99. Other (specify)

No. OF PLANTS SAMPLED (2.15)

PREVAILING STRESSES (2.18.14):
Mention the types of major stresses, i.e. abiotic (drought), biotic (pests, diseases, etc.)

ETHNOBOTANICAL DATA

LOCAL/VERNACULAR NAME (2.18.2):

ETHNIC GROUP (2.18.1)

PARTS OF PLANTS USED (2.18.6)

- | | | | |
|-------------------------|----------|---------------------|---------|
| 1. Seed | 2. Root | 3. Trunk | 4. Leaf |
| 5. Flower/Inflorescence | 6. Fruit | 99. Other (specify) | |

PLANT USES (2.18.7)

- | | | | |
|----------------|-----------|--------------------|-------------|
| 1. Food | 2. Forage | 3. Fuel | 4. Medicine |
| 5. Wood/timber | 6. Dye | 99 Other (specify) | |

ASSOCIATED FLORA (2.18.16)

MANAGEMENT

ACCESSION No. (3.1)

TYPE OF MAINTENANCE (3.8)

- | | | | |
|---------------------|------------------------|---------------------------------|-----------|
| 1. Seed | 2. Vegetative in field | 3. Vegetative in tissue culture | 4. Pollen |
| 5. Cryopreservation | 99. Other (specify) | | |

CHARACTERIZATION

GROWTH

Tree growth habit (7.1.9), Branching density (7.1.10), Branching pattern (7.1.11)

LEAF

- | | | |
|---|------------------------------|-----------------------------|
| Leaflet blade shape (7.2.9) | Leaflet blade length (7.2.7) | Leaflet blade width (7.2.8) |
| Leaflet surface pubescence (7.2.12, 7.2.13) | Young leaf colour (7.2.1) | Mature leaf colour (7.2.2) |

INFLORESCENCE

- | | |
|--|---|
| Flowering precocity (7.3.1) | Flower composition in inflorescence (7.3.6) |
| Flower disc/inflorescence colour (7.3.7) | Position of inflorescence (7.3.10) |

FRUIT

- | | | |
|-----------------------------|----------------------------|-------------------------|
| Fruit shape (7.4.11) | Fruit length (7.4.15) | Fruit diameter (7.4.16) |
| Shape of tubercles (7.4.22) | Tubercles density (7.4.23) | Aril texture (7.4.29) |

SEED

- | | | |
|---------------------|--------------------------|---------------------------------|
| Seed shape (7.5.4) | Seed coat colour (7.5.5) | Cracking of fruit skin (7.4.18) |
| Seed length (7.5.1) | Seed width (7.5.2) | |

EVALUATION

MATURITY PERIOD (8.1.3):

- | | | |
|----------|-----------------|---------|
| 1. Early | 2. Intermediate | 3. Late |
|----------|-----------------|---------|

FRUIT BEARING (8.1.4):

- | | | |
|---------|-----------|----------|
| 3. Poor | 5. Medium | 7. Heavy |
|---------|-----------|----------|

COLLECTOR'S NOTES



FUTURE
HARVEST
<www.futureharvest.org>

IPGRI is a
Future Harvest Centre
supported by the
Consultative Group on
International Agricultural
Research (CGIAR)

ISBN 92-9043-557-7